

A New Species of *Naquetia* (Muricidae) from the Gulf of Aqaba

by

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Abstract. *Naquetia fosteri* D'Attilio & Hertz, sp. nov., is described from the Gulf of Aqaba in the Red Sea; it is compared to *N. trigonula* (Lamarck, 1816) and *N. annandalei* (Preston, 1910).

INTRODUCTION

Eight specimens of a *Naquetia* species were submitted to the senior author for identification. While referable to *Naquetia*, the new species differs from similar species, *N. trigonula* (Lamarck, 1816) and *N. annandalei* (Preston, 1910), in shell characters and distribution. The new species has been reported only from the Red Sea at the Gulf of Aqaba.

TAXONOMIC ACCOUNT

Family MURICIDAE Rafinesque, 1815

Subfamily Muricinae Rafinesque, 1815

Genus *Naquetia* Jousseau, 1880

Type species: *Murex triqueter* Born, 1778, by original designation.

Naquetia is a genus of non-spinose trivariolate muricids with noded axial costae, deep anal sulcus, and anteriorly webbed varical flanges. Both radula and operculum are as in Muricinae.

Although *Naquetia* has been considered a subgenus of *Pterynotus* Swainson, 1833 (CERNOHORSKY, 1967, 1971; VOKES, 1968) and *Chicoreus* Montfort, 1810 (VOKES, 1974, 1978; HOUART, 1985), it differs from those genera based on shell morphology (RADWIN & D'ATTILIO, 1976). While

Naquetia has the trivariolate nature of the heavier *Chicoreus* (type species: *Murex ramosus* Linné, 1758), it lacks the foliaceous varical spines of *Chicoreus*. In *Naquetia* the varical extensions are sparse, appearing on the anterior end of the body whorl and canal. In *Pterynotus* (type species: *Murex pinnatus* Swainson, 1822) the three varical extensions are blade-like flanges that continue over the entire body whorl and spire.

Naquetia fosteri D'Attilio & Hertz, sp. nov.

(Figures 1-6)

Type material and locality: SDNHM 91996: Holotype (Figures 1, 2). 92.2 × 37.0 mm. Gulf of Aqaba, off Eilat, Red Sea.

SDNHM 91997: Paratype (Figures 3, 4). 71.5 × 26.2 mm. Gulf of Aqaba, off Eilat, Red Sea.

SDNHM 91998: Paratype. 75 × 29 mm. Gulf of Aqaba, off Eilat, Red Sea.

Donald Pisor Collection: Paratype (*ex* Aryeh Hadar and A. D'Attilio Collections). 77.5 × 30.5 mm. Eilat, Israel. [Figured in RADWIN & D'ATTILIO, 1976: pl. 15, fig. 10, as *N. annandalei*.]

Kay Vaught Collection No. 4583: Paratype. 75.7 × 26.5 mm. Off Eilat, Israel. 40-45 m. Dani Bloome, *leg*.

Glass and Foster Collection No. 86-037: Paratype. 94.5 × 36 mm. Eilat, Israel, Dec. 1985.

Explanation of Figures 1 to 4

Figures 1, 2. *Naquetia fosteri* sp. nov., holotype (SDNHM 91996), 92.2 × 37.0 mm (protoconch missing). Type locality: Gulf of Aqaba, off Eilat, Israel. Apertural (Figure 1) and dorsal (Figure 2) views.

Figures 3, 4. *Naquetia fosteri*, paratype (SDNHM 91997), 71.5 × 26.2 mm. Gulf of Aqaba, off Eilat, Israel in 40 m. Apertural (Figure 3) and dorsal (Figure 4) views.





Explanation of Figures 5 and 6

Figure 5. *Naquetia fosteri*, paratype (Glass and Foster Collection). Camera lucida drawing of protoconch, $\times 20.4$.

Figure 6. *Naquetia fosteri*, detail of sculpture at edge of apertural flange, $\times 2.5$.

Glass and Foster Collection No. 85-1045: Paratype. 93×37 mm. Eilat, Israel.

Glass and Foster Collection: Paratype. 81×30 mm. Gulf of Aqaba, Red Sea.

Etymology: It is with great pleasure that we name this species for Robert Foster, who with Charles Glass has been generous in making specimens from their collections available both for study and as additions to the malacology collection of the San Diego Natural History Museum.

Description: Shell (Figures 1-4) large (to 94.5×36 mm), moderately fusiform with 7-8 convex postnuclear whorls and protoconch of $1\frac{1}{2}$ convex nuclear whorls (Figure 5). Spire relatively low, less than one-half shell length. Suture impressed; aperture narrow, lenticular-ovate; outer lip edge strongly erect and recurved, with 14 denticles becoming lirae extending into aperture; anal sulcus well defined, narrow, deep, V-shaped; inner lip mostly appressed; canal long, sinuous, narrowly open, weakly recurved distally; siphonal fasciole retaining two prior canal terminations.

Three prominent rounded varices extending to and



Figure 7

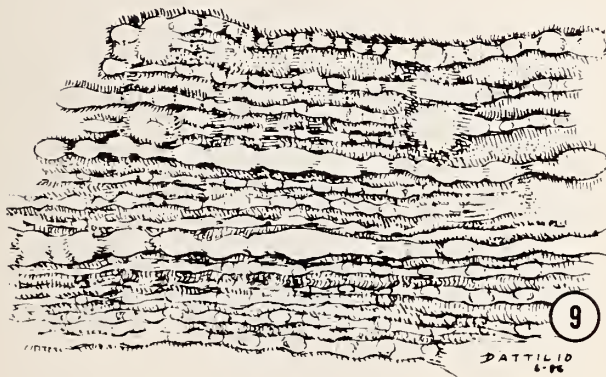
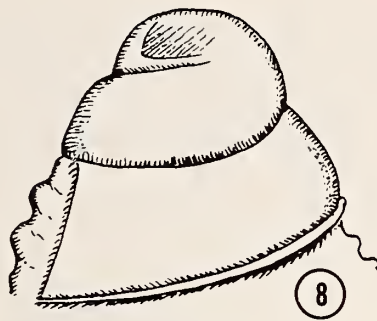
Naquetia annandalei (Preston, 1910), apertural view of holotype (ZSI Reg'd. nom. 4708/1), 76.5 mm long (per Preston). Type locality: "Off Gopalpore," Bay of Bengal.

abutting previous whorls; varices appearing with first post-nuclear whorl; receding side of varix weakly concave; 3-5 intervarical costae, irregularly distributed. Fluted varical flanges on lower portion of body whorl extend to canal.

Body-whorl sculpture of 10 primary spiral cords, 2 of which are above shoulder, with 3 additional, widely spaced cords on canal. Transverse cords with minor interstitial cords throughout, most defined on canal portion of flange. Raised nodes formed where transverse cords cross costae; growth striae very weakly defined (Figure 6). First 5 teleoconch whorls vary from bright pink to pale light orange, with cream-colored varices; remaining 3 whorls rich pink, cream, and brown; sometimes with faint indications of 3 darker brownish bands on body whorl. (In the holotype the color has faded to pale orange.) Aperture white.

Distribution: *Naquetia fosteri* is known only from the area off Eilat, Israel, in the northern end of the Gulf of Aqaba.

Remarks: Although *Naquetia fosteri* is related morphologically to its congeners *N. annandalei* (Preston, 1910) (Figure 7) and *N. trigonula* (Lamarck, 1816), material examined confirms that *N. fosteri* is a distinct taxon (see Table 1). Thirteen specimens of *N. annandalei* from 48.2 to 104.9 mm in height and 8 specimens of *N. fosteri* from 71.5 to 94.5 in height were examined. *Naquetia annandalei* is broader than *N. fosteri*. The protoconch of *N. annandalei* consists of $3\frac{1}{2}$ rounded (Figure 8) rather than $1\frac{1}{2}$ rounded whorls as in *N. fosteri* (Figure 5). The outer lip of *N. annandalei* is crenulate lacking lirae within, whereas that of *N. fosteri* bears 14 denticles which become lirate inte-



riorly. *Naquetia annandalei* has 8 moderately convex post-nuclear whorls and the body whorl is encircled by 14 extremely fine nodose spiral cords which form knobs as they cross the costae. The entire shell is transversely, microscopically sculptured, giving the shell a sandpaper-like texture (Figure 9). *Naquetia fosteri*, with 7 to 8 postnuclear whorls, has 10 strong primary cords with minor interstitial cords and no microsculpture.

Naquetia trigonula (Figure 10) is a smaller species, attaining a height of 55.5 mm compared to 94.5 mm for *N. fosteri*. *Naquetia trigonula* has a protoconch of $2\frac{1}{4}$ – $2\frac{1}{2}$ tabulate whorls (Figure 11) contrasted to the $1\frac{1}{2}$ rounded whorls in *N. fosteri*. In the 30 specimens of *N. trigonula* studied, the teleoconch is of 5 to 6 rapidly expanding whorls with 1 or 2 strongly noded intervarical costae and a body whorl of 10 rows of knobby spiral cords with fine interstitial cords and extremely fine granular microsculpture.

Explanation of Figures 8 and 9

Figure 8. *Naquetia annandalei* (Preston, 1910). Camera lucida drawing of protoconch of specimen (SDNHM 81673), 65.0 mm long, showing three rounded whorls. Shaded area designates missing portion, $\times 20.4$.

Figure 9. *Naquetia annandalei*, detail of spiral sculpture on body whorl, $\times 7.7$.

Table 1

Comparison of shell morphology in *Naquetia fosteri* sp. nov., *N. annandalei* and *N. trigonula*.

	<i>N. fosteri</i>	<i>N. annandalei</i>	<i>N. trigonula</i>
Protoconch	$1\frac{1}{2}$ convex whorls	$3\frac{1}{2}$ rounded whorls	$2\frac{1}{4}$ – $2\frac{1}{2}$ tabulate whorls
Teleoconch	7–8 whorls	8 whorls	5–6 whorls
Maximum height	94.5 mm	104.9 mm	55.5 mm
Spire-height-to-total-height ratio, mean*	0.385	0.322	0.385
Maximum width on body whorl	35 mm	46 mm	19.5 mm
Width-height ratio (W/H), mean	0.384	0.419	0.434
Aperture	lenticular-ovate; deep, narrow anal sulcus with one node on columellar side of sulcus	ovate with deep V-shaped anal sulcus; two nodes on apertural side of sulcus with thickened ridge on columellar side	lenticular with V-shaped anal sulcus; one node on columellar side of sulcus
Outer lip	14 denticles becoming lirate within	crenulate, no lirae within	13 or 14 denticles becoming lirate within
Spiral sculpture	10 strong primary cords on body whorl and canal with minor interstitial cords; no microsculpture	14 nodose cords on body whorl and canal, with fine nodose interstitial cords; extremely fine granular microsculpture	10 nodose cords on body whorl with fine nodose interstitial cords; extremely fine granular microsculpture
Axial sculpture	trivariolate, 3 or 4 noded intervarical costae	trivariolate, 3 or 4 intervarical costae, often only distinguished by nodes at the shoulder	trivariolate, 1 or 2 strongly noded intervarical costae

* Measured from receding side of apertural varix to tip of spire.

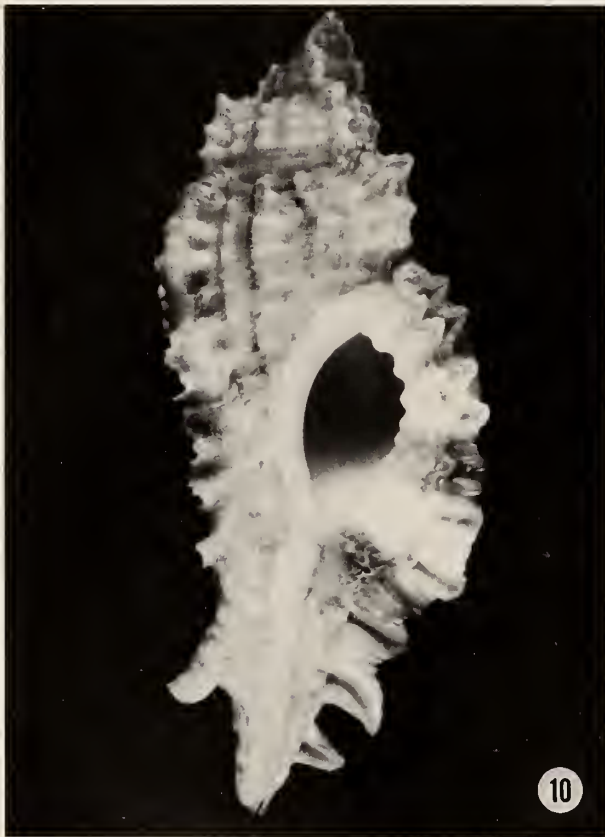


Figure 10

Naquetia trigonula (Lamarck, 1816) (SDNHM 87737), 49.3 mm long, apertural view.

Naquetia fosteri, with 7 to 8 postnuclear whorls, lacks microsculpture and bears 3 or 4 noded intervarical costae.

Naquetia trigonula occurs throughout the Indo-Pacific and *N. annandalei* is found from the Bay of Bengal to the Philippine Islands and southeastern Japan; *N. fosteri* is known only in the northern end of the Gulf of Aqaba.

ACKNOWLEDGMENTS

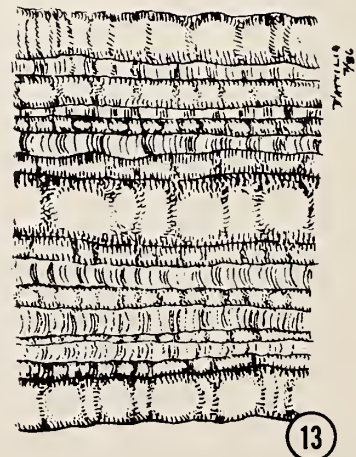
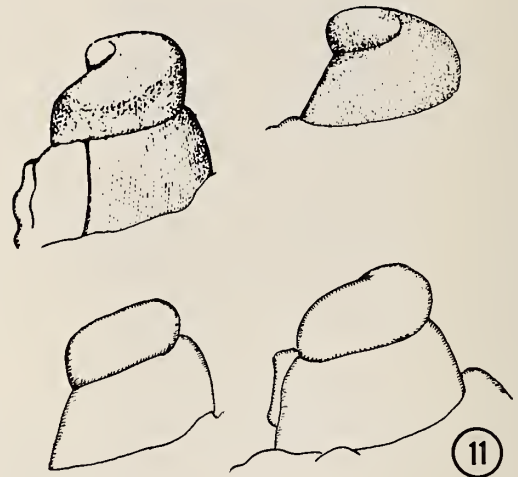
The following friends and colleagues have placed specimens at our disposal: Charles Glass and Robert Foster,

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Explanation of Figures 11 to 13

Figure 11. *Naquetia trigonula* (Lamarck, 1816), 55.5 mm long (SDNHM 85974). Camera lucida drawings showing four views of the protoconch, $\times 20.4$.

Figures 12, 13. *Naquetia trigonula*, 55.5 mm long (SDNHM 80840). Camera lucida drawings of transverse sculpture of spiral cords with depressed areas containing microsculpture. Figure 12. Spiral cords, $\times 2.5$. Figure 13. Detail of microsculpture in interspaces, $\times 7.7$.



both of Santa Barbara, California, donated the holotype (SDNHM 91996) and one paratype (SDNHM 91998) and specimens of other *Naquetia* species. Marion Magee of Speedway, Indiana, donated a paratype (SDNHM 91997). Donald Pisor of San Diego, California, Kay Vaught of Scottsdale, Arizona, and Eugenia Wright of Phoenix, Arizona, lent paratype specimens. N. V. Subba Rao of the Zoological Survey of India kindly provided photographs of the type of *N. annandalei*. William K. Emerson and Emily H. Vokes gave helpful suggestions, and Eugene Coan critically reviewed the manuscript. Theo Fusby typed the preliminary and final drafts.

Unless otherwise noted, the photography is by David K. Mulliner.

LITERATURE CITED

- BORN, I. [Edler von]. 1778. Index rerum naturalium Musei Caesarei Vindobonensis, pars I. Testacea. [Verzeichniss der natürlichen Seltenheiten des k. k. naturalien Kabinets zu Wien, erster Theil. Schalthiere.]. Pp. [xlii] + 458 + [80] + [2]; 1 pl. [not seen] Vindobonae (Krausiana).
- CERNOHORSKY, W. O. 1967. The Muricidae of Fiji (Mollusca: Gastropoda). Pt. 1. Subfamilies Muricinae and Tritonaliinae. *Veliger* 10(2):111-132, pls. 14 and 15 (Oct. 1).
- CERNOHORSKY, W. O. 1971. Contribution to the taxonomy of the Muricidae (Gastropoda: Prosobranchia). *Veliger* 14(2): 187-191 (Jan. 1).
- HOUART, R. 1985. Gros plan sur les *Naquetia* (Gastropoda: Muricidae). *Xenophora* 29:8-14 (Sept.-Oct.).
- JOUSSEAUME, F. P. 1880. Divison méthodique de la famille de *Purpurides*. *Le Naturaliste*, yr. 2(42):335-336 (Dec. 15).
- LAMARCK, J. B. P. A. DE M. DE. 1816. Tableau encyclopédique et méthodique detrois règnes de la nature (vers. testaces). Pls. 315-448. Paris.
- MONTFORT, P. D. DE. 1810. Conchyliologie systematic, et clas-sification méthodique des coquilles 2:676 pp. Paris.
- PRESTON, H. B. 1910. Descriptions of new shells. *Rec. Indian Mus.*, Calcutta 5:118-119, fig. 3.
- RADWIN, G. E. & A. D'ATTILIO. 1976. Murex shells of the world. Stanford Univ. Press: Stanford, California. 284 pp., 32 pls., 192+ text figs.
- RAFINESQUE, C. S. 1815. Analyse de la nature ou tableau de universe et des corps organisés. Pp. 5-6, 136-149, 218-223. Varravecchea: Palermo.
- SWAINSON, W. 1833. *Zool. Illus.* 2(3):22, pl. 100. Mollusca. London.
- VOKES, E. H. 1968. On the identity of *Murex trigonulus* of authors (Gastropoda: Muricidae). *Jour. Conchol.* 26(5):300-304, pl. 13. (Oct.).
- VOKES, E. H. 1974. On the identity of *Murex triqueter* Born (Gastropoda: Muricidae). *Veliger* 16(3):258-264, 1 pl. (Jan. 1).
- VOKES, E. H. 1978. Muricidae (Mollusca: Gastropoda) from the eastern coast of Africa. *Ann. Natal Mus.* 23(2):375-418, pl. 5 (Oct.).